



Academic Press Dictionary of Science and Technology

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supremum principle

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surface hydrology

supremum principle *Mathematics.* the principle that every nonempty set of real numbers that has an upper bound also has a supremum (least upper bound.).

sur *Meteorology.* a cold wind in Brazil.

sur- a prefix meaning: 1. over; above. 2. in addition.

suracón *Meteorology.* a very cold, rainy wind in Bolivia.

surbase *Architecture.* the crown molding of a pedestal or baseboard.

surcharge *Civil Engineering.* 1. any load above the ground surface. 2. any load above the top of a retaining wall.

surcharged wall *Civil Engineering.* a retaining wall carrying a surcharge, such as an embankment, usually above the top of the wall.

surf *Oceanography.* ocean waves breaking on the shore or within the area from the shore to the farthest oceanward breaker; wave activity in the surf zone.

surface *Science.* the outer part or an external aspect of an object; e.g., the earth or a body of water. *Physics.* any boundary of a body or system that is in physical contact with something external to it. *Mathematics.* a two-dimensional submanifold of three-dimensional space, in particular, of R^3 . *Aviation.* an airfoil that provides an outer contour to perform a function, such as a control surface or lifting surface.

surface acoustic wave *Acoustics.* a sound wave that travels close to the surface boundary of a medium, due to surface-boundary reflections; e.g., a shock wave produced by an earthquake or a sound wave trapped near the ocean surface due to a positive sound velocity gradient near the surface.

surface acoustic-wave device *Electronics.* any device that employs surface acoustic waves with frequencies in the range of 10^7 – 10^9 Hz to process electronic signals.

surface-active agent *Materials Science.* any substance that when dissolved reduces the surface tension or the interfacial tension between a solid and liquid.

surface-active glass *Materials.* any of various glasses developed to form a bond with living tissues by means of controlled chemical reaction at the surface of an implant; used as coatings for high-strength ceramics and surgical alloys for implants in which strength is required, such as bone and tooth replacements. Also, BIOGLASSES.

surface-air leakage *Mining Engineering.* the volume of surface air that enters a mine fan by passing through the casing at the top of the up-cast shaft, at air-lock doors, and at fan-drift walls.

surface analysis *Computer Technology.* a method of testing the surface of a disk to detect damaged areas.

surface area *Mathematics.* the two-dimensional surface measure of an object.

surface barrier *Electronics.* on the surface of a semiconductor junction, a barrier sometimes produced by the diffusion of charge carriers.

surface-barrier transistor *Electronics.* a transistor triode in which surface barriers are formed by training two jets of electrolyte against opposite surfaces of N-type semiconductor material to etch and then electroplate the surfaces.

surface biopsy *Pathology.* the removal and diagnostic examination of cells most commonly scraped from the surface of lesions suspected of cervical cancer.

surface boundary layer *Meteorology.* a thin layer of air, extending from near the earth's surface up to the base of the Ekman layer (less than 300 feet), within which shearing stresses are nearly constant and wind distribution is determined largely by the vertical temperature gradient and the nature and contours of the underlying surface. Also, GROUND LAYER, SURFACE LAYER, FRICTION LAYER.

surface carburetor *Mechanical Engineering.* a carburetor that operates by passing air over the surface of a gasoline charge to absorb vapor.

surface-charge transistor *Electronics.* an integrated-circuit transistor element which is used to control the transfer of stored electric charges along the surface of a semiconductor.

surface chart *Meteorology.* a synoptic weather chart showing the distribution of sea-level pressure and the location, intensity, and movement of fronts and air masses; the type of chart most commonly used as a "weather map." Also, SURFACE MAP, SEA-LEVEL PRESSURE CHART.

surface checking *Materials Science.* a defect that appears as surface fissures during the drying of lumber, as a result of stresses created when the surface layer loses moisture and begins to shrink before the inner core.

surface chemistry *Physical Chemistry.* the branch of chemistry that measures and analyzes the factors and forces that act at the surface of solids, liquids, and gases, or at the interfaces between two phases; e.g., the study of surface tension in liquids.

surface-coated mirror *Optics.* a mirror whose reflective coating lies on its surface. Also, FIRST-SURFACE MIRROR.

surface combustion *Engineering.* a nonluminous combustion method in which burning takes place just above a porous surface through which the combustible gas is passed.

surface condenser *Mechanical Engineering.* a heat-transfer device in which exhaust is condensed by contact with metal surfaces cooled by a flow of cold water on the sides opposite the condensing surface.

surface contamination *Nucleonics.* radioactive contamination that exists only at the surface layers of a body.

surface-controlled avalanche transistor *Electronics.* a transistor in which avalanche breakdown voltage is controlled by an external field applied through surface-insulating layers; permits operation at frequencies in the 10-gigahertz range.

surface creep *Geology.* a slow advance of sand grains downcurrent, whereby the grains move each other along the surface.

surface current *Oceanography.* 1. a current whose core of maximum velocity is near the surface. 2. a current that extends no more than 3 meters deep in nearshore areas and no more than 10 meters deep in deep water.

surface density *Physics.* the amount of a quantity distributed over a surface area divided by the unit area, such as in a surface-charge density which may be expressed with the units of coulombs/m².

surface deposit see SURFICIAL DEPOSIT.

surface detention *Hydrology.* water from precipitation that exists temporarily on the surface, producing overland flow. Also, DETENTION; DETENTION STORAGE.

surface drainage *Hydrology.* the removal of excess water from the ground surface by any natural or artificial means, such as grading; terracing, and ditch digging.

surface drilling *Mining Engineering.* a borehole or series of boreholes collared at the earth's surface rather than underground or underwater.

surface duct *Geophysics.* an atmospheric duct whose lower boundary is the surface of the earth.

surface-effect ship *Naval Architecture.* a vessel that operates on water only and is supported by low-pressure, low-velocity air.

surface energy *Fluid Mechanics.* the work per unit area required to bring fluid molecules to the interface between two immiscible liquids or between a liquid and a gas. *Materials Science.* see INTERFACIAL FREE ENERGY.

surface exclusion *Molecular Biology.* a condition in which a conjugative plasmid in a cell limits the cell's ability to acquire a similar plasmid by conjugation from another cell.

surface fermentation *Biotechnology.* a fermentation process in which the microorganism grows on the surface of the static fermentation liquor.

surface finish *Engineering.* the degree of smoothness of a surface.

surface fire *Forestry.* a forest fire that burns only surface litter, forest floor debris, and undergrowth.

surface flow see OVERLAND FLOW.

surface force *Mechanics.* an external force exerted only on the surface of a body. Also, SURFACE TRACTION.

surface friction *Geophysics.* the drag exerted on the atmosphere by the motion of the earth, usually manifested in the shearing action of the wind.

surface front *Meteorology.* see FRONT.

surface gauge *Mechanical Devices.* 1. an adjustable steel scriber mounted on a metal block or surface plate, used by machinists for testing the accuracy of planed surfaces or to mark off castings. 2. a gauge used to determine the distance of points on a plane from a reference plane.

surface geology *Geology.* a branch of geology that is concerned with the study and correlation of the geologic features at the surface of the earth.

surface grafting *Materials Science.* a chemical modification of a polymer surface by grafting a thin layer of a second polymer.

surface grinder *Mechanical Engineering.* a machine that uses a high-speed abrasive wheel to produce a plane surface.

surface hardening *Metallurgy.* a process that increases hardness at the metal surface, such as casehardening, cold drawing, or tumbling.

surface hoar *Hydrology.* a hoarfrost, consisting of leaf-shaped or plate-shaped ice crystals, formed directly on a surface of snow or on some smooth, plane surface.

surface hydrology *Hydrology.* the branch of hydrology that deals with the study of water on the land surface, as opposed to underground water.